

Inventors: Shaw et al.
Serial Number 09/653413

PATENT APPLICATION
Navy Case 80172

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Claims 1-22 (now cancelled).

23. (new) A method of distributing in real-time geospatial data over a object oriented spatial database network connecting together computers, comprising:

designing object models for the geospatial data including two or more disparate data formats;

creating an object-oriented database of the geospatial data using the object models;

storing the object-oriented database on a storage unit connected to the network;

specifying an area of interest from a visual image, representing active data objects, displayed on a computer on the network;

querying from the computer over the network data objects in the database associated with the area of interest;

receiving in the computer over the network data objects in the database associated with the area of interest; and

displaying on a display unit coupled to the computer the data objects.

24. The method of claim 23, wherein in the geospatial data includes temporal information.

25. The method of claim 23, wherein the data objects are displayed in three dimensional.

26. The method of claim 23, further comprising converting two dimensional data objects to three dimensional data objects and displaying the converted three dimensional data objects.
27. The method of claim 23, wherein the querying is performed using an interface system conforming to Common Object Request Broker Architecture.
28. A method of distributing in real-time geospatial data over an object oriented spatial database network connecting together computers, comprising:
 - designing object models for the geospatial data including two or more disparate data formats;
 - creating an object-oriented database of the geospatial data using the object models;
 - storing the object-oriented database on a storage unit connected to the network;
 - in response to performing a single action, querying from the computer over the network the database data objects associated with an area of interest;
 - receiving in the computer over the network data objects in the database associated with the area of interest.
29. The method of distributing in real-time geospatial data over a network according to claim 28, wherein the querying includes receiving database, library, theme and features as data objects.

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30. A method of distributing in real-time data having spatial and temporal information over an object oriented spatial database network connecting together computers, comprising:
- storing an object-oriented database of the data including two or more disparate data formats having spatial and temporal information on a storage unit connected to the network; and
- querying data objects in the database using spatial information of the data from a terminal connected to the network.
31. A method of building and maintaining an object-oriented spatial database from at least two or more data formats, comprising:
- instantiating objects of the object-oriented database, using at least two of Vector Product Format (VPF), Raster Product Format (RPF), Text Product Standard (TPS), Environmental Systems Research Institute (ESRI) shape, Generic Sensor Format (GSF), Naval Oceanographic Office text (NAVOCEANO), and temporal information databases;
- initializing spatial and non-spatial feature data of the object-oriented database; and
- spatially indexing data among objects from the at least two VPF, RPF, TPS, ESRI, GSF, NAVOCEANO and temporal information databases into the single, object-oriented spatial database.

32. A real-time geospatial object oriented database data distribution system, comprising:
processors, connected to each other via a network, to store in storage units connected to the processors an object-oriented database of data including two or more disparate data formats having spatial and temporal information; and to query data objects in the database using spatial information of the data from another processor connected to the network.
33. The real-time geospatial object oriented database data distribution system of claim 32, wherein the spatial information of the data is represented as a map image and a specified area of interest corresponding to the map image.
34. A real-time geospatial object oriented database data distribution system, comprising:
processors, connected to each other via a network, to store in storage units connected to the processors an object-oriented database of data including two or more disparate data formats having spatial and temporal information; to specify an area of interest from a visual image, representing active data objects, displayed on one of the processors; to query from another processor over the network data objects in the database associated with the area of interest; to receive in the one processor data objects in the database associated with the area of interest; and to display the data objects.

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35. The real-time geospatial object oriented database data distribution system of claim 34, wherein the processor queries from the database using an interface system to transmit query messages that conform to Common Object Request Broker Architecture.

36. A real-time geospatial object oriented database data distribution system, comprising: processor means, connected to each other via a network, for storing in storage means connected to the processor means an object-oriented database of data including two or more disparate data formats having spatial and temporal information; and for querying data objects in the database using spatial information of the data from another processor means connected to the network.

37. The real-time geospatial object oriented database data distribution system of claim 36, wherein the spatial information of the data is represented as a map image and a specified area of interest corresponding to the map image.

38. A real-time geospatial object oriented database data distribution system, comprising: processor means, connected to each other via a network, for storing in storage means connected to the processor means an object-oriented database of data including two or more disparate data formats having spatial and temporal information; for specifying an area of interest from a visual image, representing active data objects, displayed on one of the processor means; for querying from another processor means over the network data objects in the database associated with the

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area of interest; for receiving in the one processor means data objects in the database associated with the area of interest; and for displaying the data objects.

39. The real-time geospatial object oriented database data distribution system of claim 38, wherein the processor means query from the database using interface means for transmitting query messages conforming to Common Object Request Broker Architecture.

40. Computer programs stored on a computer-readable media to access in real-time geospatial data over a object oriented spatial database network, comprising:

an object-oriented database server code section to store data including two or more disparate data formats having spatial and temporal information;

a client code section; and

an interface code section in communication with the server code section and the client code section over the network to transmit and receive messages querying the data.

41. The computer programs of claim 40, wherein programming language of the client code section differs from programming language of the server code section.

42. The computer programs of claim 40, wherein the data includes at least two or more data formats of Vector Product Format (VPF), Raster Product Format (RPF), Text Product Standard

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(TPS), Environmental Systems Research Institute shape format (ESRI), Generic Sensor Format (GSF), and Naval Oceanographic Office text format (NAVOCEANO).

43. The computer programs of claim 40, wherein querying the data includes updating the data.

44. A real-time geospatial object oriented database distribution system, comprising:
processors, connected to each other via a network, to store in a storage unit connected to the processor an object-oriented database of data including two or more disparate data formats having spatial and temporal information; and to query data objects in the database stored in the storage unit of another processor to update the database in the storage unit of the processor querying data objects, wherein the processors have dual function of a server or a client-server.